

07.73
22868

Los Angeles
County
Museum

CONTRIBUTIONS ★ IN SCIENCE ★

NUMBER 40

MAY 11, 1961

THE MACHRIS EXPEDITION TO TCHAD, AFRICA

AMPHIBIANS AND REPTILES

By DAVID B. WAKE AND ARNOLD G. KLUGE



CONTRIBUTIONS IN SCIENCE is a series of miscellaneous technical papers in the fields of Biology, Geology and Anthropology, published at irregular intervals by the Los Angeles County Museum. Issues are numbered separately and numbers run consecutively regardless of subject matter. Number 1 was issued January 23, 1957. The series is available to scientists and scientific institutions on an exchange basis. Copies may also be purchased at a nominal price.

HILDEGARDE HOWARD

Editor

E. YALE DAWSON

Associate Editor

THE MACHRIS EXPEDITION TO TCHAD, AFRICA

Amphibians and Reptiles

By DAVID B. WAKE¹ AND ARNOLD G. KLUGE¹

During the dry season in the winter of 1960, a Los Angeles County Museum expedition under the sponsorship of Mr. and Mrs. Maurice A. Machris of Los Angeles visited the Republic of Tchad, Africa. The expedition was headed by Mr. Machris, and Dr. Charles A. McLaughlin, Associate Curator of Ornithology-Mammalogy at the Museum, and had as its prime purpose the collecting of birds and mammals. Incidental to his other work, Dr. McLaughlin obtained a small but important series of amphibians and reptiles. Virtually all collecting centered in the semi-desert and savanna country of east-central and southern Tchad. The localities where specimens were collected are indicated on the accompanying map (Fig. 1). Herpetological records for Tchad are few and the specimens collected by Dr. McLaughlin contribute to our knowledge of the distribution of various species, while several constitute major range extensions. The material from the expedition is deposited in the collections of the Los Angeles County Museum.

ACKNOWLEDGMENTS

We wish to extend our appreciation to Mr. and Mrs. Maurice A. Machris who sponsored the field work and to Dr. Charles A. McLaughlin for the privilege of reporting on the collection and for providing valuable information concerning the specimens. We thank Dr. Georges Pasteur for information on the species of *Tarentola* and Mr. David DuVal for information on *Geochelone*. We especially extend our appreciation to Dr. Jay M. Savage for his aid in identification of the specimens and for the use of his personal library. Dr. Savage also read the manuscript and made many valuable criticisms.

COLLECTING LOCALITIES

KORO TORO—a desert outpost located in a sand dune area about 350 miles northeast of Fort Lamy. The dunes are covered and held by fine bunch grass and melon vines. With the exception of the last listed locality (Gongo), all are in the Sudanese Arid Zone. The elevation is about 700 feet (225 m.).

FADA—a town located in the Ennedi Mountains. The surrounding area is pure sand, and the vegetation consists of bunch grass and scattered low acacias. Limestone and volcanic outcroppings are common. Water is found in small stream beds and in artificial ponds. The elevation of Fada is about 1800 feet (550 m.).

OUED ARCHEI—a wadi in the Ennedi Mountains near Fada. Vegetation is scarce, but permanent ponds of water do exist.

¹Department of Biology, University of Southern California.

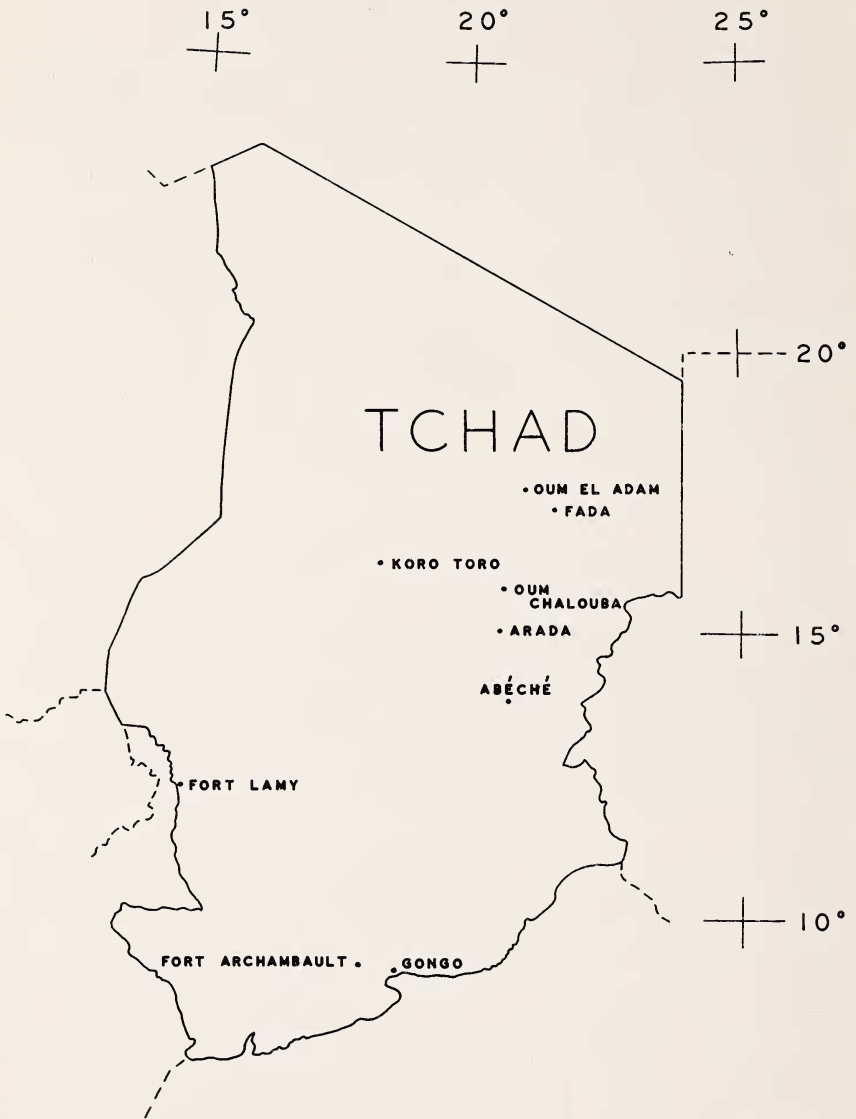


Fig. 1. Map of the Republic of Tchad showing the localities at which amphibians and reptiles were collected.

OUM EL ADAM—a village located at an elevation of about 1300 feet (385 m.) in the desert in an area of drifting dunes with some rocky outcrops. The vegetation consists of scattered bunch grass and acacias.

OUM CHALOUBA—a town located in a semi-desert situation with overgrazed bunch grass as the dominant vegetation. Rocky outcrops are common in the area. The elevation is about 1400 feet (435 m.).

ARADA—a town located in an area with vegetation similar to that of the Oum Chalouba region. The elevation is about 1624 feet (497 m.).

ABÉCHÉ—a town located on a rolling plain at about 2000 feet elevation (600 m.). The semi-desert region is dominated by scattered patches of short grass and thorny acacias.

GONGO—a small village located on the north edge of the Aouk River (Chari River drainage) at a point 45 miles east-southeast of Fort Archambault. Collections were made in the surrounding Guinean Savanna, a tall grass prairie interspersed with fingers of gallery forest and scrub thicket. The very tall, dense grass is constantly burned by the natives to permit agriculture and grazing. The area is in an ecotone between forest and savanna. The elevation of Gongo is about 1300 feet (385 m.).

SPECIES ACCOUNT AMPHIBIA

Bufo regularis Reuss Four immature specimens of this widespread African toad were collected at Fada between January 26 and February 1, 1960. The toads range from 42 to 57 mm. in snout-vent length.

Seventeen ranid frogs representing two genera (*Hemisis* and *Ptychadena*) and the following five species were found in swampy vegetation surrounding a pond located at the transition from gallery forest to tall grass savanna at Gongo.

Hemisis marmoratus (Peters) A single small (25.0 mm. snout-vent length) specimen was collected on February 23, 1960 at the Gongo pond. This is a wide-spread savanna form known from Ethiopia and Gambia in the north to Angola and Bechuanaland in the south.

Ptychadena oxyrhyncha (A. Smith) One adult female of *P. oxyrhyncha* (51.4 mm. snout-vent length) was taken in the Gongo pond mentioned above. The species is widespread in forested and semi-forested regions of Africa from Portuguese Guinea and Ethiopia in the north to South Africa. It has been recorded from Fort Crampel, Central African Republic, approximately 150 miles to the south of Gongo.

The single specimen is in a poor state of preservation and characters associated with the web and foot of the hindlimb are not easily discerned. External metatarsal tubercles and tarsal tubercles appear to be absent. No supernumerary metatarsal or tarsal tubercles are present. The web is almost complete. The terminal phalanx of toe 4 is free from the webs on both sides, slightly more than one phalanx is free from the inner web of

toe 3, and slightly more than one phalanx is free from the inner web of toe 2. The hind limb is long (slightly more than twice the body length), and the tibio-tarsal joint of the appressed limb extends far beyond the end of the snout. Three pairs of regular glandular ridges extend almost the full length of the body posterior to the eye. The color pattern consists of dark round spots arranged in longitudinal rows on a lighter background. The femur and tibia bear dark bars dorsally. The posterior border of the femur is reticulated with dark pigment. An interorbital dark bar is present but there is no vertebral stripe. The venter is immaculate, with the exception of some dark pigment on the mandibular border.

Ptychadena trinodis (Boettger) Two female frogs taken in the Gongo pond are assigned to *Ptychadena trinodis*, although this locality is far beyond the known range of the species. The larger specimen is 51.0 mm. in snout-vent length and the smaller is 50.4 mm. The internal metatarsal tubercle is large and very well-developed. A large and well-developed external metatarsal tubercle is present in both specimens. A small but well-developed tarsal tubercle is present near the proximal end of the tarsus. No supernumerary metatarsal tubercles are present. The web is only slightly reduced and extends virtually to the tip of toes 5 and 1, and to the tip on the external margins of toes 2 and 3. Two phalanges are free of the webs of toe 4, two phalanges are free from the inner web of toe 3, and slightly over one and one-half phalanges are free from the inner web of toe 2. The web exists as a very narrow fringe almost to the tip of toe 4. The robust hind limb is of moderate length (1.4 - 1.6 times body length). The tibio-tarsal joint of the appressed limb reaches the snout in the larger specimen and the nostril in the other. A number of irregular glandular ridges are present on the back. The most lateral are the longest, and are whitish in color. The color pattern consists of longitudinal series of dark spots arranged on the lighter ground color of the back to form transverse series approximating bars. A dark spot is located on each eyelid, but no interorbital bar is present. A well defined narrow, light vertebral stripe extending from the tip of the snout to the anus is present in the smaller individual, but is lacking in the other. Three to four dark bars are present on the femur and tibia. The posterior surface of the tibia is marked with alternating irregular bands of light and dark. The ventral surface is immaculate with the exception of some small dark spots in the lateral gular region and irregular spotting on the border of the mandible.

The presence of external and internal metatarsal tubercles and of a well developed tarsal tubercle is diagnostic of *P. trinodis*. These conditions are found among *Ptychadena* only in *P. trinodis*, *P. pumilio*, and *P. boettgeri*, with rudimentary tarsal tubercles reported in some *P. uzungwenensis*. Our specimens agree with *P. trinodis* and are distinguished from the other species by the characters mentioned above. Guibé and Lamotte (1957) state that *P. trinodis* is found in the savanna zones of Senegambia,

French Sudan, and French Guinea. Lamotte, Dzieduszycka, and Lauwarier (1958) record it from the region of Diafarabé in French Sudan. Diafarabé is about 1600 miles west and a little north of Congo, and Congo is 1100 miles from the nearest part of French Sudan. Guibé and Lamotte (1958) predicted that *P. trinodis* would be found in neighboring Cameroons. Early records of its occurrence in East Africa are evidently in error (Loveridge, 1957).

Ptychadena maccarthyensis (Anderson) A series of 12 small frogs from the Congo pond is tentatively assigned to *P. maccarthyensis*. Although some adult frogs are represented in the series, the general size is small (40.7-27.0 mm. snout-vent length). A moderately large internal metatarsal tubercle and a smaller, round external metatarsal tubercle are present. These specimens are noteworthy for the large number of supernumerary metatarsal and tarsal tubercles. The distribution, range, and means of the supernumerary tubercles are as follows:

metatarsal 2	0.4	(2.1)	metatarsal 5	0.6	(2.4)
metatarsal 3	2.8	(5.1)	tarsal	3.8	(6.1)
metatarsal 4	5.10	(7.1)			

No supernumerary tubercles are present on metatarsal 1. Supernumeraries are present on one or more of metatarsals 2, 3, and 4 in all 12 frogs, and on metatarsal 5 in 11 frogs. Tarsal supernumeraries are present on the surface of the tarsus, opposite the well defined tarsal fold, in all 12 frogs. In ten frogs the tarsal supernumerary nearest the heel is the largest, and in these specimens the tubercle is somewhat reminiscent of the tarsal tubercle of *P. trinodis*, although not nearly as large or well developed. Guibé and Lamotte (1957) report a more complete web in *P. maccarthyensis* than in our specimens, but webbing appears to be slightly variable intraspecifically in *Ptychadena*. None of the toes are fully webbed. About one-half of a phalanx is free from the web of toe 5, two phalanges are free of the outer web and two and one-half of the inner web of toe 4, one from the outer web and two and one-half from the inner web of toe 3, one from the outer and two from the inner web of toe 2, and one and one-half phalanges are free of the web of toe 1. The fairly robust limb is of moderate, but somewhat variable, length (1.5 - 1.8 times the body length). The tibio-tarsal articulation of the appressed limb generally reaches the nostril, but in some individuals it reaches the snout and in others falls slightly short of the nostril. Eight pairs of regular glandular ridges are present dorsally. The median pair is very short and falls far short of the eye. The ridging pattern is more similar to that illustrated by Schmidt and Inger (1959, p. 71) for *P. maccarthyensis* than the illustration of Guibé and Lamotte (1957, p. 956) for the same species. The arrangement of the pustules at the corner of the mouth and in the tympanum region is similar to that illustrated by Guibé and Lamotte (1957, p. 956) although the pustules are somewhat smaller. One male has two uniform black vocal sacs located below and extending toward the

lower insertion of the forelimb postero-obliquely from the mandibles. The distance between the vocal sacs is slightly less than that from the anterior edge of the sacs to the tip of the snout. The ground color of the dorsum is light and is marked with a variable number of rather irregularly placed dark spots that are of the same size or smaller than the tympanum. The spots are arranged in transverse rows in some individuals, but in others in longitudinal rows. The dorsal surface of the head is immaculate, but some small spots may be present on either eyelid. In three of the specimens a well defined, light line is present mid-dorsally. The line is broad anteriorly and becomes narrowed posteriorly. Alternating longitudinal irregular bands of light and dark are present on the posterior border of the femur. The dorsal surfaces of the femur and tibia are marked by three dark bars. The ventral surface is immaculate with the exception of the border of the mandibles, the throat, and the pectoral regions which are marked with black punctations.

Our specimens differ from the *P. maccarthyensis* of Guibé and Lamotte (1957) in the following characters: less extensive webbing of toes 1 and 4; presence of supernumerary metatarsal tubercles on metatarsals 2 and 5 in addition to metatarsals 3 and 4; presence of tarsal supernumerary tubercles; and smaller size. It should be mentioned that the illustration of the foot of *P. maccarthyensis* in Guibé and Lamotte (1957, p. 955) shows supernumerary tubercles on metatarsal 5, but these are not mentioned in the text. *Ptychadena maccarthyensis* is known from forest, gallery forest and savanna regions of Africa from Gambia to the Ivory Coast, according to Guibé and Lamotte (1957). Schmidt and Inger (1959), however, state that *P. maccarthyensis* is represented in the specimens from Belgian Congo identified by Noble (1924) as *Ptychadena mascareniensis*, and it appears that *P. maccarthyensis* is more widely distributed than was once thought. Significantly, *P. maccarthyensis* and *P. trinodis* have been taken together at Diafarabé, French Sudan (Lamotte, Dzieduszycka, and Lauwarier, 1958).

Ptychadena sp. One small (31.6 mm. snout-vent length) frog is unassignable to any described species as nearly as can be ascertained from the literature. This immature female, taken in the Congo pond, lacks tarsal and supernumerary tarsal and metatarsal tubercles. The external metatarsal tubercle is very small and poorly distinguished. The webbing of the hind foot is greatly reduced. Slightly more than one phalanx is free from the web of toe 5, three phalanges are free from the web of toe 4, one and one-half from the outer and two and one-half from the inner web of tone 3, one from the outer and two from the inner web of toe 2, and one and one-half phalanges are free from the web of toe 1. The robust hind limb is short (1.4 times body length), and the tibio-tarsal articulation of the appressed hind limb reaches to the center of the eye. The first finger of the fore limb is slightly longer than the second. The subarticular tubercles of the fore limb are very large. The tympanum

is smaller than the eye. The nostril is located nearer the snout than the eye. Dorsal glandular ridges are present, but they are very irregular. The most regular are the lateral whitish ridges. The dorsal ground color is rather dark, with a number of small darker spots. The spots are mostly lateral in position and are generally longer than broad. Several small spots are located on either eyelid. The dorsal surfaces of the femur and tibia are inconspicuously barred with dark spots, and the posterior surface of the femur is marked with irregular dark vermiculations. The ventral surface is immaculate and white, with pigment along the borders of the mandible. One conspicuous dark bar is located on either mandibular ramus directly under the eye.

The single specimen has a shorter, broader, and less pointed head than any of the species described above, and its body form is more robust than any of the sympatric species. Similarities between this individual and certain described species have been ascertained from the literature. According to Laurent (1954), *P. frontalis* is a short-limbed frog in which the tibio-tarsal articulation of the appressed limb reaches to a point between the tympanum and the nostril. Laurent's description is partially corroborated by Schmidt and Inger (1959) who commented on the short legs of *P. frontalis*. However, the latter authors also noted the presence of supernumerary tubercles on the metatarsals of *P. frontalis*, in contrast to the situation in our specimen. The Gongo example has a fuller web than *P. frontalis*, and the color pattern of the posterior portion of the femur and the back, and the pattern of the dorsal glandular ridges also differ from the situation described for *P. frontalis*. Laurent (1954) examined the types of *P. abyssinica* and compared this species with *P. frontalis*. He noted the short limbs and the similarity of the webbing in the two species. The external metatarsal tubercle of *P. abyssinica* is poorly developed in contrast to *P. frontalis*. The degree of webbing in *P. frontalis*, and presumably in *P. abyssinica*, differs from that in our specimen. Parker (1930) assigned *P. abyssinica* to the synonymy of the long-legged *P. oxyrhyncha*, but as pointed out by Laurent (1954) the former is a short-legged species. Our specimen is certainly not referable to *P. oxyrhyncha*. Only sketchy descriptions of *P. abyssinica* are available, and the limited information makes it impossible for us to determine whether or not the specimen under consideration should be assigned to that species.

Rana occipitalis Günther Seven examples of this widely distributed river frog were taken in stream beds and artificial ponds at Fada between January 26 and February 1, 1960. The specimens range from 49.6 to 70.6 mm. in snout-vent length.

REPTILIA

Ptyodactylus hasselquisti hasselquisti (Donndorf) Four geckos were taken at Fada on February 1, 1960. Pertinent anatomical features of the two males and two females are as follows: snout-vent length 72.0 mm.,

65.0 mm., 59.0 mm., and 53.5 mm. respectively; internasals 1; supralabials 9-11, mean 10; infralabials 11; tubercle rows on dorsum (rows somewhat irregular) 13-15, mean 13.7; scansors under fourth toe 10-13, mean 11.5; uniform fawn in color.

Ptyodactylus h. hasselquisti ranges from Asia to Niger and Algeria across northern Africa. The nearest known record to Fada is from the Tibesti Mountains of northern Tchad.

Tarentola neglecta Strauch A female of this very distinctive gecko was taken at Fada on February 1, 1960, and one female was taken at Gongo on February 23, 1960. The salient characters of the Gongo and Fada specimens respectively are as follows: snout-vent length 69.6 mm. and 73.2 mm.; internasals 0 and 1; interorbitals 13 and 12; supralabials 8 and 8; infralabials 8 and 8; breadth of mental divided into its length 1.3 and 1.4; dorsal tubercle rows 13 and 14; scansors under fourth toe 14 and 17. The dark brown eye bar is very obvious and continues posteriorly to form the dorsal body reticulation.

Loveridge (1947) states that *T. neglecta* is known from the Algerian Sahara east to Libya. The Gongo locality is approximately 1200 miles southeast of the nearest locality recorded by Loveridge (Serdeles, Libya).

Tarentola annularis (Geoffroy) One specimen was collected at Oum Chalouba, one at Arada, and one at Gongo on February 8, February 11, and February 23, 1960, respectively. The salient characters of the Oum Chalouba (male), Arada (male), and Gongo (female) specimens respectively are as follows: snout-vent length 89.1 mm., 66.6 mm., and 53.2 mm.; internasals 2, 1, 1; interorbitals 18, 18, 16; supralabials 10, 11, 10; infralabials 9, 9, 10; breadth of mental divided into its length 1.5, 1.6, 1.8; dorsal tubercle rows 12, 12, 12; scansors under fourth toe 19, 21, 20. The male specimen from Arada has a dark brown ground color. The female is very light.

Loveridge (1947) considered *Tarentola annularis* and *T. ehippiata* to be closely related, and included *T. ehippiata* as a subspecies of *T. annularis*. His decision has led to some confusion, and, on the basis of our material, we find it impossible to consider these forms conspecific. The most obvious character differentiating the two species is the shape of the tail. In *T. annularis* the tail is greatly depressed, with a lateral serration formed by enlarged, laterally projected scales. In *T. ehippiata* the tail is rounded and without an obvious lateral serration. The distinctness of these two species has been reiterated by Dr. Georges Pasteur (*in litt.*).

Tarentola annularis is known from Arabia west to Libya and south to Sudan, Ethiopia, and British Somaliland, according to Loveridge (1947). Our records appear to be the first for Tchad, and the Gongo locality is apparently at the southwest border of the known range.

Chamaeleo gracilis Hallowell One chamaeleon was taken in the gallery forest near Gongo on February 22, 1960. The tarsal spur is particularly evident in this individual. The species is a savanna form found

along the edges of the rain forest zone in Africa, from Senegal and French Somaliland probably to Angola.

Uromastix acanthinurus Gray Two specimens were taken at Fada on January 29, 1960. A male of 175 mm. (snout-vent length) is dark in coloration with black head, shoulders, and throat, and black blotches between the whorls on the dorsal surface of the tail. The ventral surfaces, other than the throat, are white with scattered black bars and blotches. The 187 mm. (snout-vent length) female is lighter than the male with a light head covered with brown reticulations. The ventral surfaces are an immaculate and uniform whitish color. Black blotches are present only between the whorls on the dorsal surface of the tail. *Uromastix* is a north African element and has been found in several saharan mountain ranges, but has not been recorded previously from the Ennedi region.

Agama agama Linné Two specimens of this wide ranging African species were taken at Abéché on February 10 and 12, 1960, and 12 specimens were taken at Gongo on February 20, 1960. Geographic variation in this species is not well understood, and subspecific determination of these specimens has not been attempted.

Mabuya quinquetaeniata (Lichtenstein) Two male skinks were taken at Fada on February 1, 1960. The characteristics of the specimens are as follows: snout-vent length 83.5 mm. and 78.0 mm.; supraciliaries 5 and 6; scales around middle of body 36 and 36; dorsal and lateral scales tricarinate; anterior nuchals mostly tricarinate, a few quinquecarinate. Three indistinct light bluish lines are located on the dorsum of both specimens, with a very distinct whitish lateral line extending from the tip of the snout to the groin on either side. This widespread savanna species reaches the Mediterranean Sea along the Nile River drainage, but apparently has not been recorded before from the semi-desert mountain areas of central Africa.

Tarbophis obtusus (Reuss) A single snake was taken at Oum el Adam on January 31, 1960. The characters of this juvenile male are as follows: supralabials 10 (4, 5, and 6 enter eye); infralabials 11 (first four in contact with anterior chinshield); temporals 2+3+4(5); scale rows 20-20-15; ventrals 265; subcaudals 65+1; snout-vent length 255 mm.; tail length 39 mm. The dorsal body coloration consists of 79 rather well defined quadrangular light brown bars; the venter is immaculate. The distinctness of the dorsal body blotches may be due to the age of the specimen.

Tarbophis obtusus is a wide ranging colubrid snake of the arid semi-desert regions from Mauritania to Somalia, but has not been recorded previously from Tchad.

Geochelone sulcata (Miller) One tortoise was taken at Koro Toro; another was purchased from a convict at Fada and almost certainly was taken at that place. Carapace length of these two specimens is 400.2 mm. and 201.8 mm. respectively. According to Loveridge and Williams

(1957), *G. sulcata* is known from desert regions across Africa at about 15° N Latitude, but the species evidently has not been recorded previously from Tchad.

Crocodilus niloticus Laurenti The common African crocodile was sighted, but not collected, in Oued Archei near Fada, in the Ennedi Mountains. This is the sole species of Amphibia or Reptilia recorded from the Ennedi region by Angel and Lhote (1938). It apparently survives in permanent ponds in the wadi.

LITERATURE CITED

- Angel, F. and H. Lhote.
1938. Reptiles et Amphibiens du Sahara central et du Soudan. Bull. Com. Et. histor. et scient. de l'Afrique Occidentale Française, 21: 345-384.
- Guibé, Jean and Maxime Lamotte.
1957. Révision systématique des *Ptychadena* (Batraciens Anoures Ranidés) d'Afrique occidentale. Bull. Inst. Franç. Afrique Noire, 19(3): 937-1003.
1958. Les *Ptychadena* (Batraciens Ranidés) du Cameroon. Bull. Inst. Franç. Afrique Noire, 20(4): 1448-1461.
- Lamotte, Maxime, Sophie Dzieduszycka, and Guy Lauwarier.
1958. Contribution à l'étude des Batraciens de l'Ouest africain VIII. Les formes larvaires de *Ptychadena submascareniensis*, *Pt. tournieri* et *Pt. trinodis*. Bull. Inst. Franç. Afrique Noire, 20(4): 1464-1482.
- Laurent, R.
1954. Etude de quelques espèces méconnues de genre *Ptychadena*. Ann. Mus. Roy. Congo Belge, Ser. 8, 34: 1-34.
- Loveridge, Arthur.
1947. Revision of the African lizards of the family Gekkonidae. Bull. Mus. Comp. Zool., 98(1): 1-469.
1957. Checklist of the Reptiles and Amphibians of East Africa (Uganda; Kenya; Tanganyika; Zanzibar). Bull. Mus. Comp. Zool., 117(2): 153-362.
- Loveridge, Arthur and Ernest E. Williams.
1957. Revision of the African tortoises and turtles of the Suborder Cryptodira. Bull. Mus. Comp. Zool., 115(6): 163-557.
- Noble, G. K.
1924. Contributions to the herpetology of the Belgian Congo based on the collection of the American Museum Congo Expedition, 1909-1915. Part III. Amphibia. Bull. Amer. Mus. Nat. Hist., 49(2): 147-347.
- Parker, H. W.
1930. Report on the Amphibia collected by Mr. J. Omer-Cooper in Ethiopia. Proc. Zool. Soc. London, 1930: 1-6.
- Schmidt, Karl P. and Robert F. Inger.
1959. Exploration du Parc National de l'Upemba. I. Mission G. F. de Witte. Amphibiens. Inst. Parcs Nat. du Congo Belge, 56: 1-264.